

The following listing of claims replaces all previous listings and versions of the claims in this application:

Listing of Claims:

1 Claim 1 (Currently Amended): An overvoltage protection circuit for a conductor, the
2 circuit comprising:

3 a first switching means for connecting said conductor to a reference potential;
4 and a first trigger means operable to switch said switching means from a first,
5 OFF state to a second, ON state;

6 wherein said first trigger means is voltage-triggered by voltages exceeding a first
7 magnitude on said conductor and current-triggered by a current trigger element in
8 response to voltages exceeding a second magnitude on said conductor, thereby to
9 provide overvoltage protection at two discrete voltage magnitudes;

10 said current trigger element comprises first and second parallel resistive
11 elements;

12 wherein said current trigger element is connectable in series with said conductor.

1 Claim 2 (Original): A circuit as claimed in claim 1 wherein said first magnitude is greater
2 than said second magnitude.

1 Claim 3 (Original): A circuit as claimed in claim 2 wherein said first trigger means
2 comprises a current trigger element for current triggering said first switching means
3 when said voltage on said conductor exceeds said second magnitude.

1 Claim 4 (Original): A circuit as claimed in claim 2 wherein said first trigger means
2 comprises a voltage trigger element for voltage triggering said first switching means
3 when said voltage on said conductor exceeds said first magnitude.

1 Claim 5 (Original): A circuit as claimed in claim 3 wherein said current trigger element is
2 operable to generate a trigger signal in dependence on the current flowing through said
3 conductor, thereby to trigger conduction of said switching means in response to said
4 current exceeding a preselected value.

1 Claim 6 (Original): A circuit as claimed in claim 5 wherein said current trigger element
2 comprises a resistive element.

Claims 7-8 (Cancelled)

1 Claim 9 (Original): A circuit as claimed in claim 3 wherein said first trigger means
2 comprises a voltage trigger element for voltage triggering said first switching means
3 when said voltage on said conductor exceeds said first magnitude.

1 Claim 10 (Original): A circuit as claimed in claim 9 wherein said current trigger element
2 is operable to generate a trigger signal in dependence on the current flowing through
3 said conductor, thereby to trigger conduction of said switching means in response to
4 said current exceeding a preselected value.

1 Claim 11 (Currently Amended) An overvoltage protection circuit for a conductor, the
2 circuit comprising:

3 a first SCR having a cathode terminal for connection to said conductor, an anode
4 terminal for connection to a reference potential, and a gate;

5 and a first trigger operable to switch said first SCR from a first, OFF state to a
6 second, ON state;

7 wherein:

8 ~~wherein~~ said first trigger is voltage-triggered by voltages exceeding a first magnitude on
9 said conductor and current-triggered by voltages exceeding a second magnitude on
10 said conductor, thereby to provide overvoltage protection at two discrete voltage
11 magnitudes;

12 said first trigger comprises a current trigger element for current triggering said
13 first SCR when said voltage on said conductor exceeds said second magnitude;

14 said current trigger element comprises first and second parallel resistive
15 elements;

16 and said current trigger element is connectable in series with said conductor.

1 Claim 12 (Original): A circuit as claimed in claim 11 wherein said first magnitude is
2 greater than said second magnitude.

Claim 13 (Cancelled)

1 Claim 14 (Currently Amended) A circuit as claimed in claim 12 wherein said current
2 trigger element is operable to generate a trigger signal in dependence on the current
3 flowing through said conductor, thereby to trigger conduction of said SCR ~~switching~~
4 ~~means~~ in response to said current exceeding a preselected value.

1 Claim 15 (Currently Amended) A circuit as claimed in claim ~~[[13]]~~ 11 wherein said
2 current trigger element is connected between said gate and said cathode terminal.

Claims 16-18 (Cancelled)

1 Claim 19 (Original): A circuit as claimed in claim 11 wherein said first trigger comprises
2 a voltage trigger element for voltage triggering said first SCR when said voltage on said
3 conductor exceeds said first magnitude.

1 Claim 20 (Currently Amended): A circuit as claimed in claim 19 wherein:
2 said first SCR comprises a first npn transistor device and a second pnp transistor
3 device;

4 each transistor device has its base electrically connected to the collector of the
5 other device;

6 the emitter of each device is electrically connected to a respective one of the
7 anode and cathode terminals;

8 the base of one of the devices is electrically connected to the ~~[[gat]]~~ gate of the
9 SCR;

10 said voltage trigger element is a zener diode means which is electrically
11 connected across the bases of said devices;

12 and said zener diode means has a preselected reverse breakdown voltage to
13 trigger conduction of said first SCR in response to said voltage on said conductor
14 exceeding said first magnitude.

1 Claim 21 (Original): A circuit as claimed in claim 19 wherein said voltage trigger
2 element is a transistor device connected between said gate and said anode terminal

3 and the base of the transistor device is connected to a preselected reference voltage at
4 said first magnitude.

1 Claim 22 (Currently Amended): A circuit as claimed in claim ~~[[20]]~~ 28 wherein said
2 voltage trigger element is a third npn transistor device having its collector connected to
3 the emitter of the second pnp transistor device, its emitter connected to said gate, and
4 its base connected to a preselected reference voltage at said first magnitude.

1 Claim 23 (Original): A circuit as claimed in claim 11 further comprising a diode means
2 connected in antiparallel between said anode and cathode terminals.

1 Claim 24 (Original): A circuit as claimed in claim 11 further comprising:
2 a second SCR connected in antiparallel to said first SCR;
3 and second trigger;
4 wherein:
5 said first trigger is voltage triggered by voltages exceeding said first magnitude of
6 a first polarity and said second trigger is voltage triggered by voltages exceeding said
7 first magnitude of the reverse polarity.

1 Claim 25 (Original): A circuit as claimed in claim 11 further comprising:
2 a complementary, second SCR connected in parallel with said first SCR so as to
3 provide a complementary pair of SCRs;
4 and second trigger operable to switch said first SCR from a first, OFF state to a
5 second, ON state;
6 wherein:
7 said first trigger is voltage-triggered by voltages of a first polarity exceeding said
8 first magnitude on said conductor and current-triggered by voltages of said first polarity
9 exceeding said second magnitude on said conductor;
10 and said second trigger is voltage-triggered by voltages of the reverse polarity
11 exceeding said first magnitude on said conductor and current-triggered by voltages of
12 said reverse polarity exceeding said second magnitude on said conductor;
13 thereby to provide overvoltage protection at two discrete voltage magnitudes of
14 both polarities.

1 Claim 26 (Original): A circuit as claimed in claim 12 wherein said first trigger comprises
2 a current trigger element for current triggering said first switching means when said
3 voltage on said conductor exceeds said second magnitude.

1 Claim 27 (Original): A circuit as claimed in claim 26 wherein said current trigger element
2 is operable to generate a trigger signal in dependence on the current flowing through
3 said conductor, thereby to trigger conduction of said switching means in response to
4 said current exceeding a preselected value.

1 Claim 28 (New): An overvoltage protection circuit for a conductor, the circuit comprising:
2 a first SCR having a cathode terminal for connection to said conductor, an anode
3 terminal for connection to a reference potential, and a gate;
4 and a first trigger operable to switch said first SCR from a first, OFF state to a
5 second, ON state;
6 wherein:
7 said first trigger is voltage-triggered by voltages exceeding a first magnitude on
8 said conductor and current-triggered by voltages exceeding a second magnitude on
9 said conductor, thereby to provide overvoltage protection at two discrete voltage
10 magnitudes;
11 said first trigger comprises a voltage trigger element for voltage triggering said
12 first SCR when said voltage on said conductor exceeds said first magnitude;
13 said voltage trigger element is a transistor device connected between said gate
14 and said anode terminal and the base of the transistor device is connected to a
15 preselected reference voltage at said first magnitude.

1 Claim 29 (New): An overvoltage protection circuit for a conductor, the circuit
2 comprising:
3 a first SCR having a cathode terminal for connection to said conductor, an anode
4 terminal for connection to a reference potential, and a gate;
5 a second SCR connected in antiparallel to said first SCR;
6 a first trigger operable to switch said first SCR from a first, OFF state to a

second, ON state;
and a second trigger;
wherein:
said first trigger is voltage-triggered by voltages exceeding a first magnitude on
said conductor and current-triggered by voltages exceeding a second magnitude on
said conductor, thereby to provide overvoltage protection at two discrete voltage
magnitudes;
and said first trigger is voltage triggered by voltages exceeding said first
magnitude of a first polarity and said second trigger is voltage triggered by voltages
exceeding said first magnitude of the reverse polarity.

Claim 30 (New): An overvoltage protection circuit for a conductor, the circuit
comprising:

a first SCR having a cathode terminal for connection to said conductor, an anode
terminal for connection to a reference potential, and a gate;

a complementary, second SCR connected in parallel with said first SCR so as to
provide a complementary pair of SCRs;

a first trigger operable to switch said first SCR from a first, OFF state to a
second, ON state;

and second trigger operable to switch said first SCR from a first, OFF state to a
second, ON state;

wherein:

said first trigger is voltage-triggered by voltages exceeding said first magnitude
on said conductor and current-triggered by voltages exceeding said second magnitude
on said conductor, thereby to provide overvoltage protection at two discrete voltage
magnitudes;

and said second trigger is voltage-triggered by voltages of the reverse polarity
exceeding said first magnitude on said conductor and current-triggered by voltages of
said reverse polarity exceeding said second magnitude on said conductor;

thereby to provide overvoltage protection at two discrete voltage magnitudes of
both polarities.

1 Claim 31 (New): An overvoltage protection circuit for a conductor, the circuit comprising:
2 a first SCR having a cathode terminal for connection to said conductor, an anode
3 terminal for connection to a reference potential, and a gate;
4 a diode means connected in antiparallel between said anode and cathode
5 terminals;
6 and a first trigger operable to switch said first SCR from a first, OFF state to a
7 second, ON state;
8 wherein:
9 said first trigger is voltage-triggered by voltages exceeding a first magnitude on
10 said conductor and current-triggered by voltages exceeding a second magnitude on
11 said conductor, thereby to provide overvoltage protection at first and second discrete
12 voltage magnitudes;
13 said diode means provides overvoltage protection at a third discrete voltage
14 magnitude that is of opposite polarity to the polarity of the first and second discrete
15 voltage magnitudes;
16 said first trigger comprises a current trigger element for current triggering said
17 first switching means when said voltage on said conductor exceeds said second
18 magnitude;
19 said current trigger element comprises first and second parallel resistive
20 elements;
21 and said current trigger element is connectable in series with said conductor.